

# SEQUENCE LISTING

<110> Novozymes Biotech, Inc.

<120> Microbial Trypsin Mutants Having Chymotrypsin Activity And Nucleic Acids Encoding Same

<130> 10211.204-US

<150> 60/413,057

<151> 2002-09-24

<160> 23

<170> PatentIn version 3.2

<210> 1

<211> 998

<212> DNA

<213> Fusarium oxysporum

```

<400> 1
atcatcaacc actcttcaact cttcaactct cctctcttgg atatctatct cttcaccatg      60
gtcaagttcg cttccgctcg tgcacttggt gctcccctgg ctgctgccgc tcctcaggag      120
atccccaaca ttgttggtgg cacttctgcc agcgctggcg actttccctt catcgtgagc      180
attagccgca acggtggccc ctggtgtgga ggttctctcc tcaacgcaa caccgtcttg      240
actgctgccc actgcgtttc cggatacgtc cagagcgggt tccagattcg tgctggcagt      300
ctgtctcgca cttctggtgg tattacctcc tcgctttcct ccgtcagagt tcaccctagc      360
tacagcggaa acaacaacga tcttgctatt ctgaagctct ctacttccat cccctccggc      420
ggaaacatcg gctatgctcg cctggctgct tccggctctg accctgtcgc tggatcttct      480
gccactgttg ctggctgggg cgctacctct gagggcggca gctctactcc cgtcaacctt      540
ctgaaggtta ctgtccctat cgtctctcgt gctacctgcc gagctcagta cggcacctcc      600
gccatcacca accagatgtt ctgtgctggt gtttcttccg gtggcaagga ctcttgccag      660
ggtgacagcg gcggcccat cgtcgacagc tccaacactc ttatcggtgc tgtctcttgg      720
ggtaacggat gtgcccgaac caactactct ggtgtctatg ccagcgttgg tgctctccgc      780
tctttcattg acacctatgc ttaaatacct tgttggaagc gtcgagatgt tccttgaata      840
ttctctagct tgagtcttgg atacgaaacc tgtttgagaa ataggtttca acgagttaag      900
aagatatgag ttgatttcag ttggatctta gtcctggttg ctcgtaatag agcaatctag      960
atagcccaaa ttgaatatga aatttgatga aaatattc      998

```

<210> 2  
 <211> 248  
 <212> PRT  
 <213> Fusarium oxysporum

<400> 2

Met Val Lys Phe Ala Ser Val Val Ala Leu Val Ala Pro Leu Ala Ala  
 1 5 10 15

Ala Ala Pro Gln Glu Ile Pro Asn Ile Val Gly Gly Thr Ser Ala Ser  
 20 25 30

Ala Gly Asp Phe Pro Phe Ile Val Ser Ile Ser Arg Asn Gly Gly Pro  
 35 40 45

Trp Cys Gly Gly Ser Leu Leu Asn Ala Asn Thr Val Leu Thr Ala Ala  
 50 55 60

His Cys Val Ser Gly Tyr Ala Gln Ser Gly Phe Gln Ile Arg Ala Gly  
 65 70 75 80

Ser Leu Ser Arg Thr Ser Gly Gly Ile Thr Ser Ser Leu Ser Ser Val  
 85 90 95

Arg Val His Pro Ser Tyr Ser Gly Asn Asn Asn Asp Leu Ala Ile Leu  
 100 105 110

Lys Leu Ser Thr Ser Ile Pro Ser Gly Gly Asn Ile Gly Tyr Ala Arg  
 115 120 125

Leu Ala Ala Ser Gly Ser Asp Pro Val Ala Gly Ser Ser Ala Thr Val  
 130 135 140

Ala Gly Trp Gly Ala Thr Ser Glu Gly Gly Ser Ser Thr Pro Val Asn  
 145 150 155 160

Leu Leu Lys Val Thr Val Pro Ile Val Ser Arg Ala Thr Cys Arg Ala  
 165 170 175

Gln Tyr Gly Thr Ser Ala Ile Thr Asn Gln Met Phe Cys Ala Gly Val  
 180 185 190

Ser Ser Gly Gly Lys Asp Ser Cys Gln Gly Asp Ser Gly Gly Pro Ile  
 195 200 205

Val Asp Ser Ser Asn Thr Leu Ile Gly Ala Val Ser Trp Gly Asn Gly  
 210 215 220

Cys Ala Arg Pro Asn Tyr Ser Gly Val Tyr Ala Ser Val Gly Ala Leu  
 225 230 235 240

Arg Ser Phe Ile Asp Thr Tyr Ala  
 245

<210> 3  
 <211> 992  
 <212> DNA  
 <213> Fusarium oxysporum

<400> 3  
 atcatcaacc actcttcact cttcaactct cctctcttgg atatctatct cttcaccatg 60  
 gtcaagttcg cttccgctcg tgcacttggt gctcccctgg ctgctgccgc tcctcaggag 120  
 atccccaaca ttgttggtgg cacttctgcc agcgctggcg actttccctt catcgtgagc 180  
 attagccgca acggtggccc ctggtgtgga ggttctctcc tcaacgccaa caccgtcttg 240  
 actgctgccc actgcgtttc cggatacgct cagagcgggt tccagattcg tgctggcagt 300  
 ctgtctcgca cttctggtgg tattacctcc tcgctttcct ccgtcagagt tcaccctagc 360  
 tacagcggaa acaacaacga tcttgcatt ctgaagctct ctacttccat cccctccggc 420  
 ggaaacatcg gctatgctcg cctggctgct tccggctctg accctgtcgc tggatcttct 480  
 gccactactg ctggctgggg cgctacctct gagggcggca gctctactcc cgtcaacctt 540  
 ctgaaggtta ctgtccctat cgtctctcgt gctacctgcc gagctcagta cggcacctcc 600  
 gccatcacca accagatggt ctgtgctggt gcttccggtg gctcttcttg catgggtgac 660  
 agcggcggcc ccatcgtcga cagctccaac actcttatcg gtactgtctc ttgggggttct 720  
 ggaacttggt ctacttctac tcctggtgtc tatgccagcg ttggtgctct ccgctctttc 780  
 attgacacct atgcttaa atcttggtgg aagcgtcgag atgttccttg aatattctct 840  
 agcttgagtc ttggatacga aacctgtttg agaaataggt ttcaacgagt taagaagata 900  
 tgagttgatt tcagttggat cttagtcctg gttgctcgta atagagcaat ctagatagcc 960  
 caaattgaat atgaaatttg atgaaaatat tc 992

<210> 4  
 <211> 246  
 <212> PRT  
 <213> Fusarium oxysporum

<400> 4

Met Val Lys Phe Ala Ser Val Val Ala Leu Val Ala Pro Leu Ala Ala  
 1 5 10 15

Ala Ala Pro Gln Glu Ile Pro Asn Ile Val Gly Gly Thr Ser Ala Ser  
 20 25 30

Ala Gly Asp Phe Pro Phe Ile Val Ser Ile Ser Arg Asn Gly Gly Pro  
 35 40 45

Trp Cys Gly Gly Ser Leu Leu Asn Ala Asn Thr Val Leu Thr Ala Ala  
 50 55 60

His Cys Val Ser Gly Tyr Ala Gln Ser Gly Phe Gln Ile Arg Ala Gly  
 65 70 75 80

Ser Leu Ser Arg Thr Ser Gly Gly Ile Thr Ser Ser Leu Ser Ser Val  
 85 90 95

Arg Val His Pro Ser Tyr Ser Gly Asn Asn Asn Asp Leu Ala Ile Leu  
 100 105 110

Lys Leu Ser Thr Ser Ile Pro Ser Gly Gly Asn Ile Gly Tyr Ala Arg  
 115 120 125

Leu Ala Ala Ser Gly Ser Asp Pro Val Ala Gly Ser Ser Ala Thr Thr  
 130 135 140

Ala Gly Trp Gly Ala Thr Ser Glu Gly Gly Ser Ser Thr Pro Val Asn  
 145 150 155 160

Leu Leu Lys Val Thr Val Pro Ile Val Ser Arg Ala Thr Cys Arg Ala  
 165 170 175

Gln Tyr Gly Thr Ser Ala Ile Thr Asn Gln Met Phe Cys Ala Gly Ala  
 180 185 190

Ser Gly Gly Ser Ser Cys Met Gly Asp Ser Gly Gly Pro Ile Val Asp  
 195 200 205

Ser Ser Asn Thr Leu Ile Gly Ile Val Ser Trp Gly Ser Gly Thr Cys  
 210 215 220

Ser Thr Ser Thr Pro Gly Val Tyr Ala Ser Val Gly Ala Leu Arg Ser  
 225 230 235 240

Phe Ile Asp Thr Tyr Ala  
 245

<210> 5  
 <211> 34  
 <212> DNA  
 <213> Fusarium oxysporum

<400> 5  
 ggatcttctg ccactactgc tggctggtaa gtcg 34

<210> 6  
 <211> 34  
 <212> DNA  
 <213> Fusarium oxysporum

<400> 6  
 cgacttacca gccagcagta gtggcagaag atcc 34

<210> 7  
 <211> 43  
 <212> DNA  
 <213> Fusarium oxysporum

<400> 7  
 gacacctatg ctttaattaat accttggttg aagcgtcgag atg 43

<210> 8  
 <211> 43  
 <212> DNA  
 <213> Fusarium oxysporum

<400> 8  
 catctcgacg cttccaacaa ggtattaatt aagcataggt gtc 43

<210> 9  
 <211> 74  
 <212> DNA  
 <213> Fusarium oxysporum

<400> 9  
 agtacggcac ctccgccatc accaaccaga tgttctgtgc tggtgcttcc ggtggctctt 60  
 cttgcatggg tgac 74

<210> 10  
 <211> 74  
 <212> DNA  
 <213> *Fusarium oxysporum*

<400> 10  
 agcggcggcc ccatcgtcga cagctccaac actcttatcg gtatcgtctc ttggggttct 60  
 ggaacttggt ctac 74

<210> 11  
 <211> 64  
 <212> DNA  
 <213> *Fusarium oxysporum*

<400> 11  
 ttctactcct ggtgtctatg ccagcggttg tgctctccgc tctttcattg acacctatgc 60  
 ttaa 64

<210> 12  
 <211> 81  
 <212> DNA  
 <213> *Fusarium oxysporum*

<400> 12  
 ttaagcatag gtgtcaatga aagagcggag agcaccaacg ctggcataga caccaggagt 60  
 agaagtagaa caagttccag a 81

<210> 13  
 <211> 74  
 <212> DNA  
 <213> *Fusarium oxysporum*

<400> 13  
 accccaagag acgataccga taagagtgtt ggagctgtcg acgatggggc cgccgctgtc 60  
 acccatgcaa gaag 74

<210> 14  
 <211> 56  
 <212> DNA  
 <213> *Fusarium oxysporum*

<400> 14	56
agccaccgga agcaccagca cagaacatct ggttggtgat ggcggagggtg ccgtat	
<210> 15	
<211> 24	
<212> DNA	
<213> Fusarium oxysporum	
<400> 15	24
cccagactca gtacggcacc tccg	
<210> 16	
<211> 22	
<212> DNA	
<213> Fusarium oxysporum	
<400> 16	22
cccttaatta agcataggtg tc	
<210> 17	
<211> 21	
<212> DNA	
<213> Fusarium oxysporum	
<400> 17	21
ttcatattca atttgggcta t	
<210> 18	
<211> 21	
<212> DNA	
<213> Fusarium oxysporum	
<400> 18	21
tatctcagat gtcagagaac g	
<210> 19	
<211> 21	
<212> DNA	
<213> Fusarium oxysporum	
<400> 19	21
atggtcaagt tcgcttcgt c	
<210> 20	
<211> 21	
<212> DNA	
<213> Fusarium oxysporum	
<400> 20	21
gctctgaccc tgtcgctgga t	

<210> 21  
<211> 21  
<212> DNA  
<213> Fusarium oxysporum

<400> 21  
ctgccaacat agataatgag g 21

<210> 22  
<211> 21  
<212> DNA  
<213> Fusarium oxysporum

<400> 22  
gttggatcctt agtcctgggtt g 21

<210> 23  
<211> 21  
<212> DNA  
<213> Fusarium oxysporum

<400> 23  
atccaagact caagctagag a 21